

CLAIMS

1. A method for positioning components to be joined together, wherein the components are held from a position within a desired arrangement of the components to be joined by at least one central module with a plurality of articulated arms (clamping device).
2. The method according to claim 1, wherein the clamping device waits in a first rest position with folded in arms and/or arms applied to the central module in a predetermined inoperative position, subsequently the components to be joined are at least roughly assembled by further suitable handling devices, the clamping device being positioned in a space within the components to be joined and then the components are clamped by suitable positioning of the arms in the space.
3. The method according to claim 1, wherein prior to a tacking together of the components, position measurements are performed on the components to be joined and if position deviations are established active position corrections are brought about by the clamping device.
4. The method according to claim 3, wherein measured position values are buffer stored and after the detection of a deviation trend are used for the correction of a control program for the clamping device and/or for messages to a quality assurance unit.
5. The method according to claim 1, wherein following a subsequent tacking together of the components or further

downstream production processes, the clamping device independently again moves out of the space within the components.

6. The method according to claim 1, wherein, following the subsequent tacking together of the components or further downstream production processes, the clamping device is moved again out of the space within the components by a further handling device.

7. The method according to claim 3, wherein tacking together is carried out by the actual clamping device using suitable tools.

8. The method according to claim 1, wherein the arms are positioned synchronously in space in accordance with a control unit.

9. The method according to claim 1, wherein the arms are positioned asynchronously in space in accordance with a control unit.

10. The method according to claim 1, wherein movements of the arms take place in in each case at least three degrees of freedom.

11. The method according to claim 1, wherein the clamping device is directly supported on a base part of the component structure.

12. The method according to claim 1, wherein the clamping device is supported on a conveyor element carrying the components.

13. A device for positioning components to be joined together, wherein there is a movable central module and a plurality of articulated arms, which are movable in space and connected thereto and which in each case have at least one holding element for holding the components.

14. The device according to claim 13, wherein the arms are constructed for movements with in each case at least three degrees of freedom.

15. The device according to claim 13, wherein a plurality of arms in each case has at least one tool for the connection of the assembled components.

16. The device according to claim 13, wherein it can be brought into a space within a desired arrangement of the components to be joined and following a subsequent tacking together of the components or further downstream production processes can be removed again therefrom.

17. The device according to claim 13, wherein there is a computer-based control unit.

18. The device according to claim 13, wherein the arms have means for media supply to the holding elements and/or tools.

19. The device according to claim 13, wherein the central module has means for media supply to the arms.

20. The device according to claim 13, wherein the central module has a power supply unit.

21. The device according to claim 13, wherein the arms are constructed for the provision of high static holding forces up to 3000 N.

22. The device according to claim 13, wherein each arm has its own control-relevant point or TCP.

23. The device according to claim 13, wherein the latter is constructed for automatically moving into a space within the components to be joined.

24. The device according to claim 13, wherein the latter is constructed for automatically moving out of the space within the components to be joined.

25. The device according to claim 13, wherein the arms can be folded in and/or applied to the central module.

26. The device according to claim 13, wherein there is at least one support mechanism for supporting the clamping device on a component of the component structure and/or a component-carrying conveyor element.

27. The device according to claim 13, wherein on the arms and/or central module are provided sensors for recording measured position values for the components and/or further measured values relevant with respect to a quality assurance for the downstream production processes.

28. The device according to claim 26, wherein there is a storage unit for the buffer storage of the measured values.